

AGANA/BREWER MY

Latitude = 13.48 N

Longitude = 144.80 E

Period of Record = 1973 to 1996

WMO No. 912120

Elevation = 299 feet

Average Pressure = 29.51 inches Hg

Design Criteria Data

	Design Value	Mean Coincident (Average) Values			
		Wet Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Dry Bulb Temperature (T)	(°F)				
Median of Extreme Highs	93	80	138	9.8	E
0.4% Occurrence	90	79	132	11.4	E
1.0% Occurrence	89	78	132	11.8	E
2.0% Occurrence	89	78	132	11.8	E
Mean Daily Range	10	-	-	-	-
97.5% Occurrence	75	72	115	7.6	ENE
99.0% Occurrence	74	71	112	7.4	ENE
99.6% Occurrence	73	70	107	6.7	ENE
Median of Extreme Lows	71	69	103	5.9	ENE
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Wet Bulb Temperature (T_{wb})	(°F)				
Median of Extreme Highs	85	88	176	9.1	E
0.4% Occurrence	82	87	154	10.6	E
1.0% Occurrence	81	86	149	10.6	E
2.0% Occurrence	80	85	145	10.4	E
	Design Value	Mean Coincident (Average) Values			
		Dry Bulb Temperature (°F)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Humidity Ratio (HR)	(gr/lb)				
Median of Extreme Highs	207	89	1.34	13.8	ENE
0.4% Occurrence	159	85	1.04	9.6	E
1.0% Occurrence	153	84	1.00	9.4	E
2.0% Occurrence	153	84	1.00	9.2	E
Air Conditioning/ Humid Area Criteria	# of Hours	T ≥ 93°F	T ≥ 80°F	T _{wb} ≥ 73°F	T _{wb} ≥ 67°F
		1	5485	7732	8655

Other Site Data

Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75°F-RH 60% Latent + Sensible
10	N/A	N/A	22.2 + 4.9
Ground Water Temperature (°F) 50 Foot Depth *	Frost Depth 50 Year Recurrence (in.)	Ground Snow Load 50 Year Recurrence (lb/ft ²)	Average Annual Freeze-Thaw Cycles (#)
83.7	N/A	N/A	0

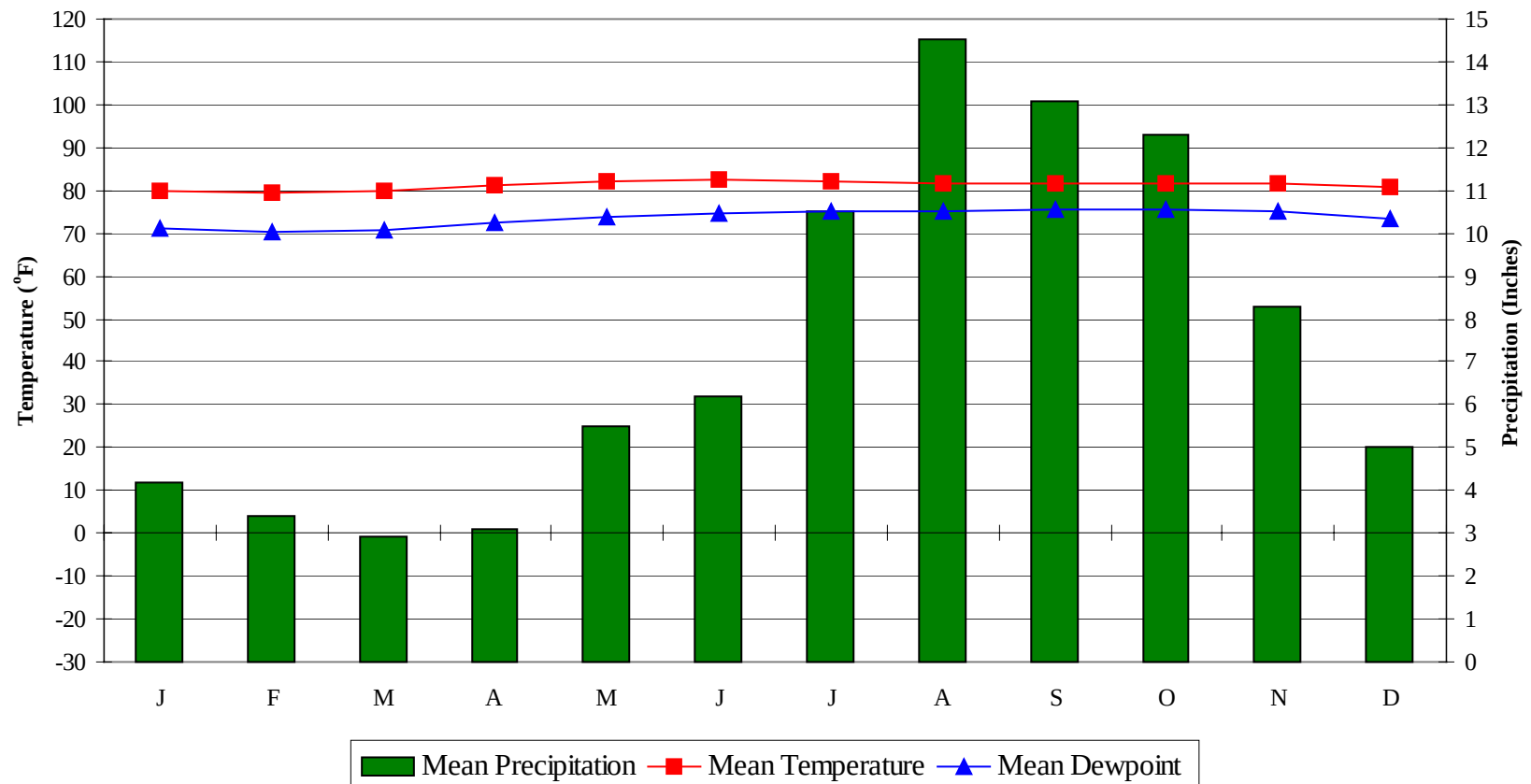
*Note: Temperatures at greater depths can be estimated by adding 1.5°F per 100 feet additional depth.

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Average Annual Climate

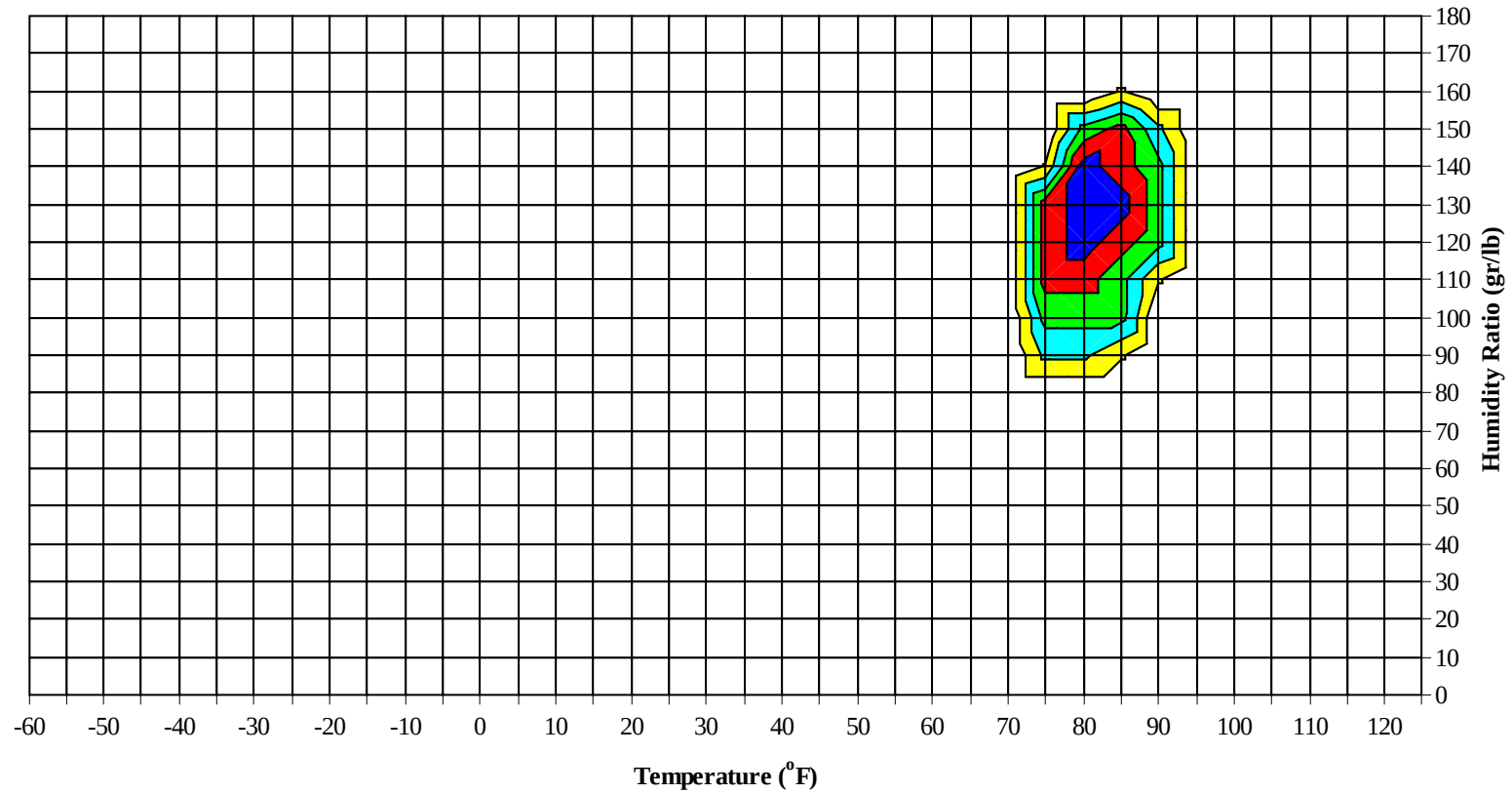


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Long Term Psychrometric Summary



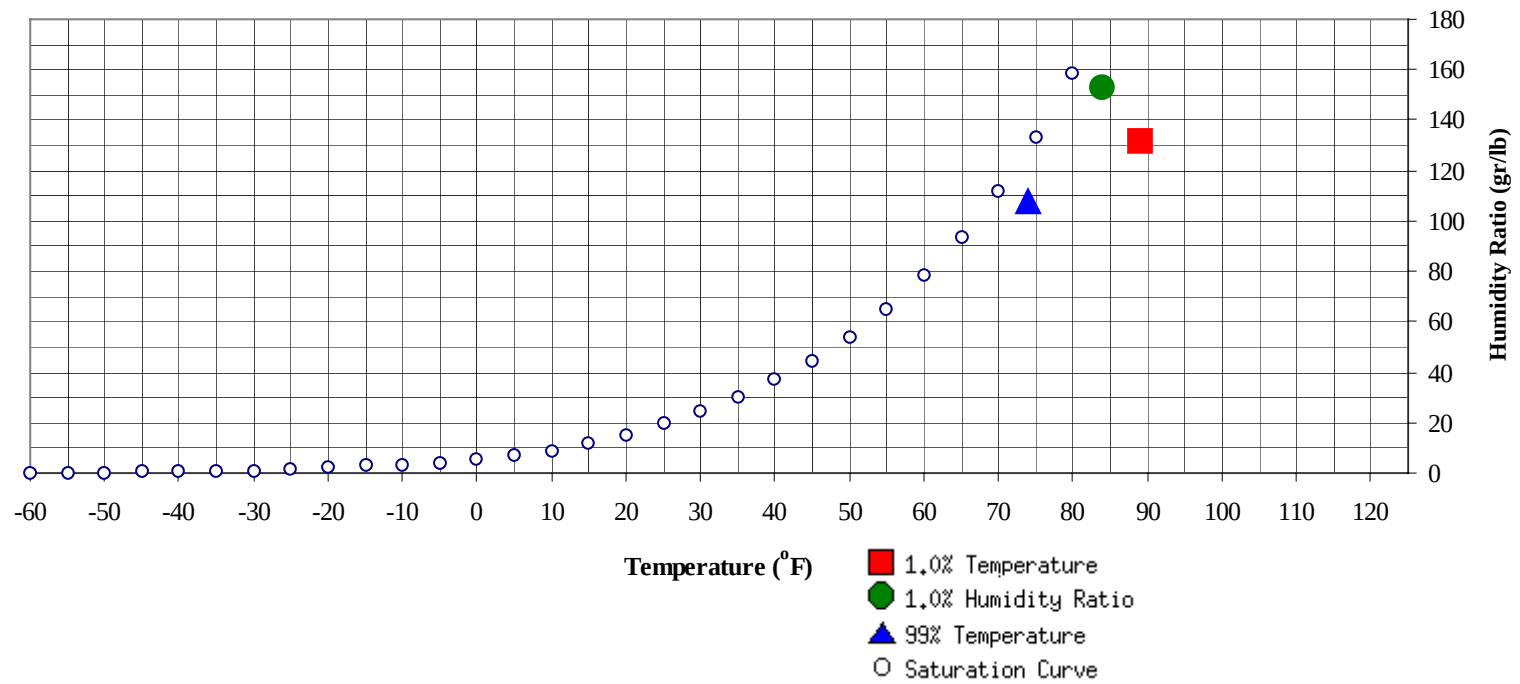
- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

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Psychrometric Summary of Peak Design Values



	(°F)	MCHR	Enthalpy	1.0% Humidity Ratio	(gr/lb)	MCDB	MCWB	MC Dewpt	Enthalpy
		(gr/lb)	(btu/lb)			(°F)	(°F)	(°F)	(btu/lb)
99% Dry Bulb	74	108	34.6	Ratio	153.3	84	80.3	79	44.2

1.0% Dry Bulb	(°F)	MCHR	MCWB	Enthalpy
		(gr/lb)	(°F)	(btu/lb)
	89	132	78.4	42.1

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Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	January					February					March				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99		0		0	74.0										
90 / 94		0		0	77.0		0		0	75.0		1		1	76.9
85 / 89	0	78	2	80	76.0		64	2	66	74.9	0	105	6	111	75.1
80 / 84	35	150	86	271	74.7	12	135	58	204	74.1	23	127	85	235	74.4
75 / 79	190	19	153	363	72.9	185	25	155	365	72.5	205	15	152	372	72.8
70 / 74	22	1	7	30	69.6	27	0	9	36	69.8	20	0	5	25	70.1
65 / 69	1		0	1	66.4	0			0	66.0	0		0	0	68.0
60 / 64													0	0	

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

AGANA/BREWER MY

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Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	April					May					June				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99											0			0	85.0
90 / 94	0	5		5	77.1	0	12	0	12	78.0	0	17	0	17	78.2
85 / 89	1	147	13	161	76.1	6	166	22	194	77.3	7	160	28	195	78.0
80 / 84	60	82	134	276	75.4	113	64	173	350	76.3	140	56	177	373	76.6
75 / 79	178	6	93	277	73.8	129	6	53	188	74.8	93	7	35	135	75.3
70 / 74	1	0	0	1	71.3	0		0	0	72.4	0	0	0	0	72.5
65 / 69						0		0	0		0			0	
60 / 64															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	July					August					September				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99															
90 / 94	0	11	0	11	79.1		10	0	10	79.9	0	10	0	10	79.9
85 / 89	6	145	24	175	78.5	5	132	20	157	79.0	5	129	16	150	79.0
80 / 84	110	76	164	350	76.9	99	76	149	323	77.2	98	79	155	332	77.3
75 / 79	131	16	59	206	75.3	142	29	78	250	75.4	136	21	69	226	75.5
70 / 74	1	0	1	2	72.2	2	1	1	4	72.1	1	1	0	2	72.6
65 / 69						0			0						
60 / 64															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	October					November					December				
	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)	Hour Group (LST)			Total Obs	M C W B (°F)
	01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00			01 To 08	09 To 16	17 To 00		
100 / 104															
95 / 99		0		0	82.0							0		0	86.0
90 / 94	0	9		9	80.1		2	0	2	79.4		0	0	0	80.5
85 / 89	4	141	13	158	78.9	2	138	7	147	78.4	0	101	3	104	81.1
80 / 84	106	79	163	348	77.2	105	88	163	356	77.0	74	137	139	350	77.4
75 / 79	137	18	71	225	75.5	132	12	70	214	75.3	170	10	105	285	76.1
70 / 74	1	1	1	3	72.2	1	0	0	1	71.4	4	0	1	5	74.1
65 / 69															70.4
60 / 64															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

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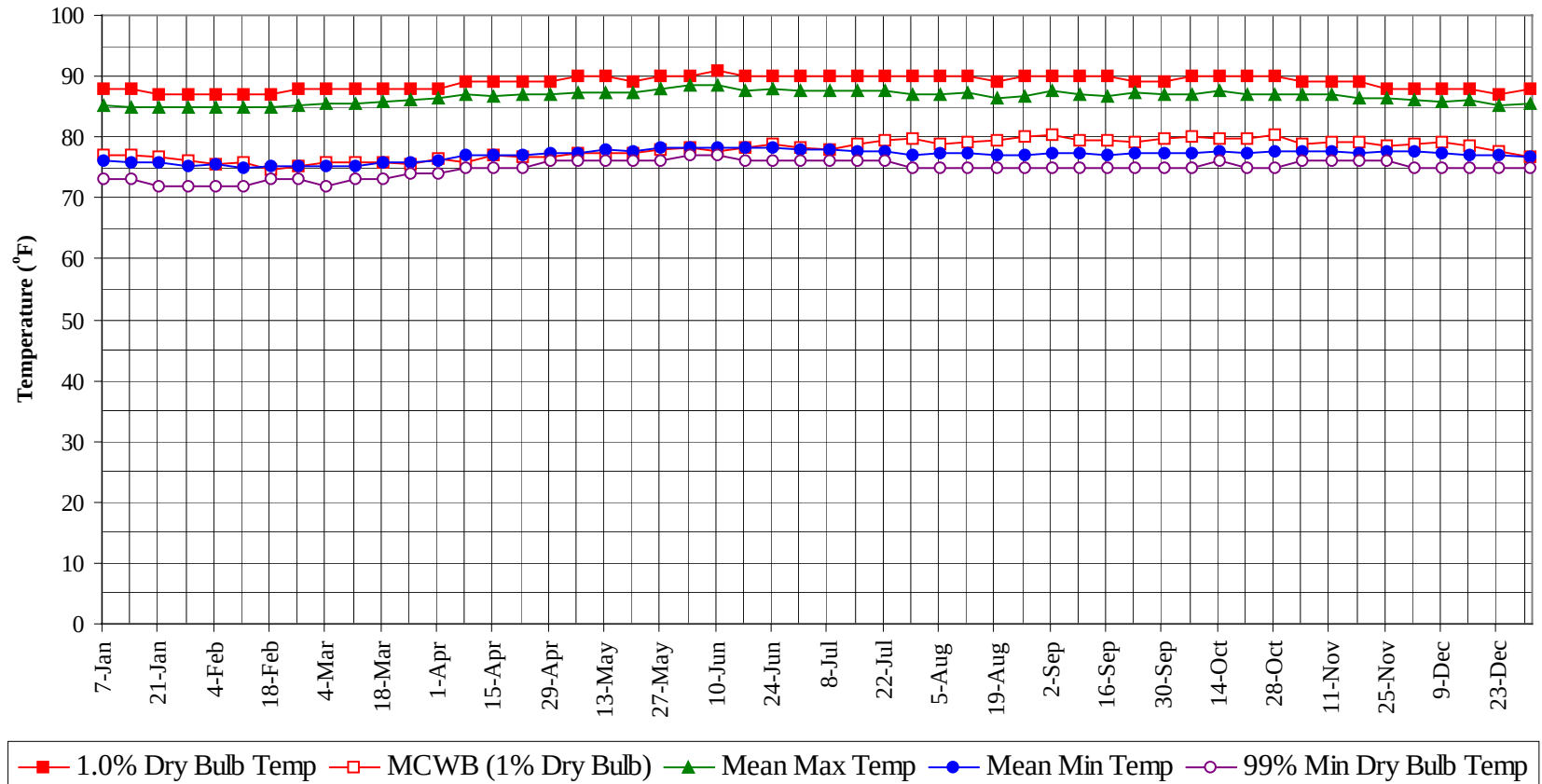
Period of Record = 1973 to 1996

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

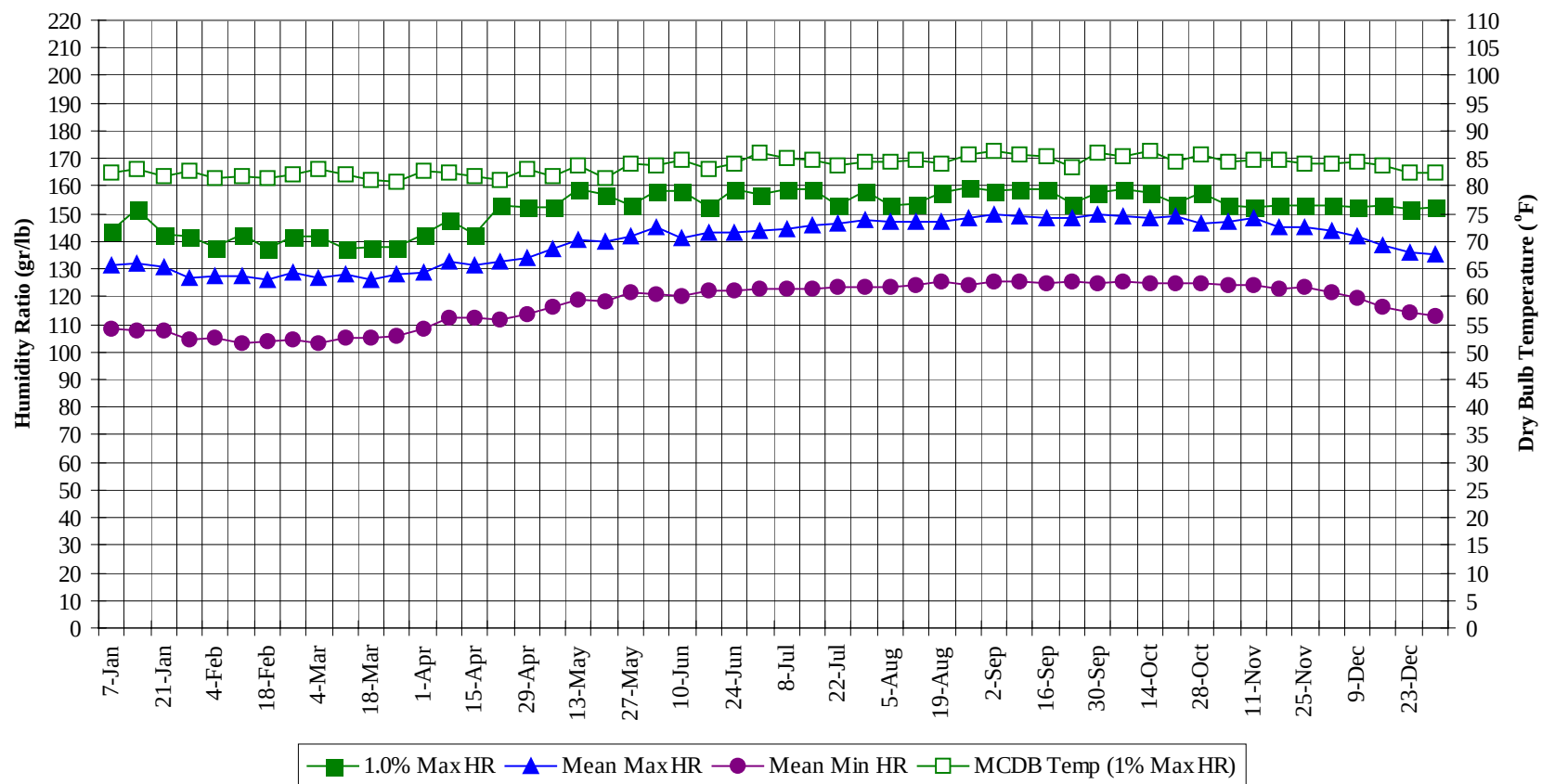
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Annual Summary of Temperatures



Long Term Humidity and Dry Bulb Temperature Summary



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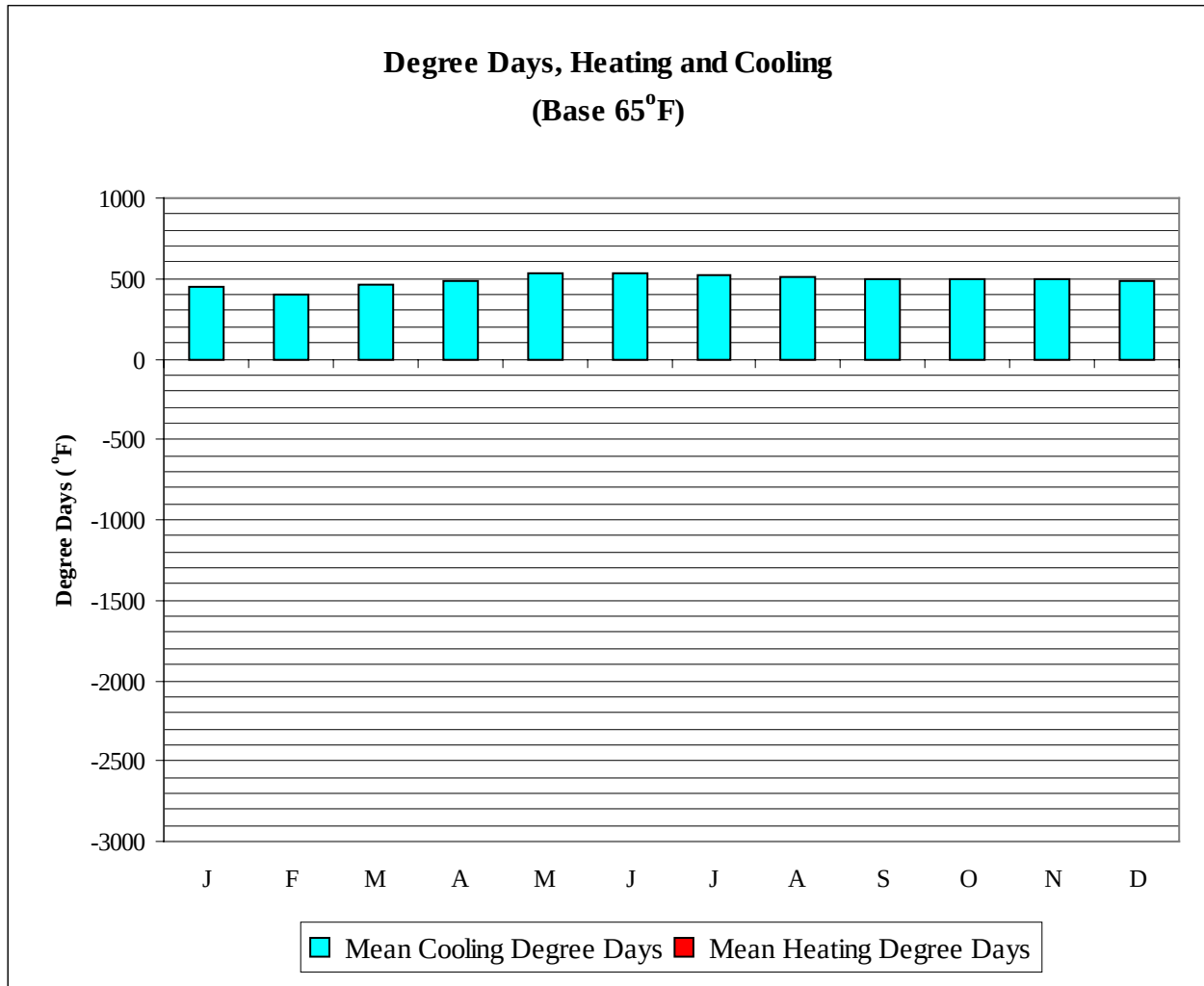
Long Term Dry Bulb Temperature and Humidity Summary

Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	88.0	77.0	85.3	76.2	73.0	143.5	82.3	131.6	108.6
14-Jan	88.0	77.1	85.0	75.9	73.0	151.9	82.9	132.2	107.8
21-Jan	87.0	76.6	85.0	75.9	72.0	142.8	81.9	130.7	107.9
28-Jan	87.0	76.2	85.0	75.3	72.0	142.1	82.9	126.4	104.6
4-Feb	87.0	75.7	85.0	75.5	72.0	137.9	81.3	127.5	105.3
11-Feb	87.0	76.0	84.9	74.9	72.0	142.8	81.9	127.3	103.2
18-Feb	87.0	74.7	84.8	75.3	73.0	137.2	81.3	126.2	103.5
25-Feb	88.0	75.3	85.1	75.1	73.0	142.1	81.9	128.5	104.5
4-Mar	88.0	76.0	85.5	75.1	72.0	142.1	83.1	127.0	103.2
11-Mar	88.0	75.8	85.6	75.4	73.0	137.2	82.2	127.9	105.0
18-Mar	88.0	75.7	85.9	75.7	73.0	137.9	81.3	125.8	104.9
25-Mar	88.0	75.4	86.0	75.7	74.0	137.9	80.7	127.9	105.6
1-Apr	88.0	76.3	86.3	76.3	74.0	142.8	82.9	128.8	108.4
8-Apr	89.0	75.9	87.0	76.9	75.0	147.7	82.3	132.4	112.3
15-Apr	89.0	77.1	86.9	77.0	75.0	142.8	81.8	131.6	112.2
22-Apr	89.0	76.6	87.0	77.0	75.0	153.3	81.2	132.8	111.7
29-Apr	89.0	76.6	87.0	77.3	76.0	152.6	82.9	133.9	113.7
6-May	90.0	77.4	87.2	77.4	76.0	152.6	81.7	137.5	116.0
13-May	90.0	77.4	87.3	78.0	76.0	158.9	83.8	140.5	119.1
20-May	89.0	77.5	87.2	77.7	76.0	156.8	81.5	139.7	118.3
27-May	90.0	78.1	87.8	78.3	76.0	153.3	84.1	141.8	121.2
3-Jun	90.0	78.1	88.4	78.3	77.0	158.2	83.7	145.1	121.0
10-Jun	91.0	77.5	88.4	78.3	77.0	158.2	84.9	141.0	120.0
17-Jun	90.0	78.3	87.7	78.4	76.0	152.6	83.2	143.2	122.2
24-Jun	90.0	78.8	88.1	78.2	76.0	158.9	84.1	143.3	122.3
1-Jul	90.0	78.3	87.7	78.0	76.0	156.8	86.0	143.9	122.7
8-Jul	90.0	77.8	87.5	77.8	76.0	158.9	85.0	144.5	122.5
15-Jul	90.0	78.8	87.5	77.7	76.0	158.9	84.8	146.1	123.0
22-Jul	90.0	79.6	87.5	77.6	76.0	153.3	83.8	146.2	123.4
29-Jul	90.0	79.7	87.1	77.1	75.0	158.2	84.3	147.5	123.6
5-Aug	90.0	78.9	87.1	77.2	75.0	153.3	84.2	147.4	123.8
12-Aug	90.0	79.1	87.3	77.2	75.0	154.0	84.7	147.1	124.2
19-Aug	89.0	79.4	86.5	77.0	75.0	157.5	84.1	147.1	125.2
26-Aug	90.0	80.0	86.8	76.9	75.0	159.6	85.8	148.6	124.2
2-Sep	90.0	80.4	87.5	77.5	75.0	158.2	86.5	149.4	125.2
9-Sep	90.0	79.6	87.1	77.4	75.0	158.9	85.6	149.3	125.6
16-Sep	90.0	79.3	86.7	77.2	75.0	158.9	85.5	148.6	124.8
23-Sep	89.0	79.1	87.4	77.4	75.0	154.0	83.3	148.5	125.2
30-Sep	89.0	79.6	87.0	77.4	75.0	157.5	86.0	149.6	124.8
7-Oct	90.0	80.0	87.1	77.5	75.0	158.9	85.4	149.4	125.1
14-Oct	90.0	79.9	87.6	77.5	76.0	157.5	86.3	148.7	124.9
21-Oct	90.0	79.8	87.1	77.3	75.0	154.0	84.4	148.8	124.5
28-Oct	90.0	80.3	87.2	77.6	75.0	157.5	85.7	146.7	124.9
4-Nov	89.0	78.9	87.1	77.5	76.0	153.3	84.3	147.1	124.1
11-Nov	89.0	79.0	87.0	77.8	76.0	152.6	84.9	148.2	124.0
18-Nov	89.0	79.2	86.5	77.4	76.0	153.3	84.7	144.9	122.9
25-Nov	88.0	78.7	86.3	77.6	76.0	153.3	84.0	144.8	123.5
2-Dec	88.0	78.9	86.2	77.6	75.0	153.3	84.2	144.0	121.4
9-Dec	88.0	79.3	85.9	77.3	75.0	152.6	84.5	141.9	119.2
16-Dec	88.0	78.5	86.0	77.1	75.0	153.3	83.7	138.5	116.4
23-Dec	87.0	77.5	85.3	76.9	75.0	151.9	82.3	136.1	114.2
31-Dec	88.0	76.8	85.5	76.7	75.0	152.6	82.6	135.0	113.0

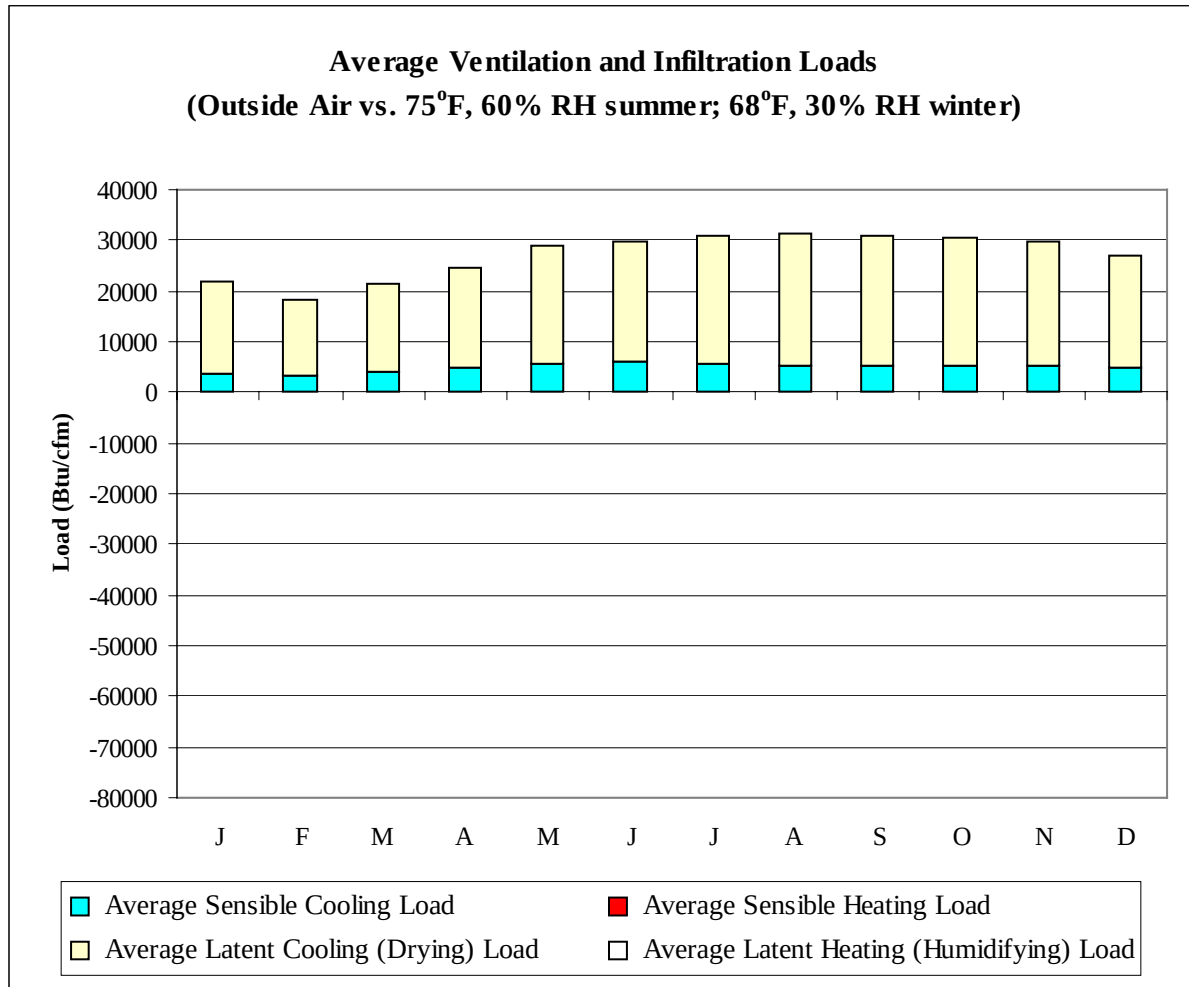
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	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	455	0
FEB	404	0
MAR	465	0
APR	491	0
MAY	532	0
JUN	528	0
JUL	526	0
AUG	511	0
SEP	498	0
OCT	496	0
NOV	496	0
DEC	490	0
ANN	5892	0



	Average Sensible Cooling Load	Average Sensible Heating Load	Average Latent Cooling Load	Average Latent Heating Load
	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)	(Btu/cfm)
JAN	3860	0	17909	0
FEB	3218	0	15039	0
MAR	4072	0	17182	0
APR	4950	0	19551	0
MAY	5766	0	23067	0
JUN	5905	0	23867	0
JUL	5595	0	25498	0
AUG	5231	0	26095	0
SEP	5143	0	25610	0
OCT	5139	0	25237	0
NOV	5078	0	24606	0
DEC	4684	0	22186	0
ANN	58641	0	265847	0

Average Annual Solar Radiation – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

City: GUAM
 State: PI
 WBAN No: 41415
 Lat(N): 13.55
 Long(E): 144.83
 Elev(ft): 361

Stn Type: Primary
 SHADING GEOMETRY IN DIMENSIONLESS UNITS
 Window: 1
 Overhang: 0.906
 Vert Gap: 0.2

AVERAGE INCIDENT SOLAR RADIATION (Btu/sq.ft./day), Percentage Uncertainty = 9		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ	Global	1400	1530	1730	1830	1810	1740	1610	1540	1540	1460	1390	1330	1580
	Std Dev	93	126	122	109	140	91	93	152	102	110	102	85	58
	Minimum	1210	1290	1470	1660	1500	1540	1440	1210	1310	1160	1180	1150	1470
	Maximum	1570	1780	1930	2050	2080	1870	1820	1870	1730	1700	1590	1460	1710
	Diffuse	670	740	820	850	850	860	900	910	870	800	700	650	800
Clear Day	Global	1920	2130	2360	2480	2490	2470	2470	2460	2380	2190	1950	1840	2260
NORTH	Global	390	420	460	530	760	860	770	570	460	430	400	380	540
	Diffuse	390	420	460	480	550	580	570	500	460	430	400	380	470
Clear Day	Global	320	340	360	470	920	1170	1060	600	360	340	320	300	550
EAST	Global	800	860	950	1000	980	940	890	850	860	830	810	770	880
	Diffuse	490	530	580	610	600	590	600	590	580	540	510	470	560
Clear Day	Global	1100	1210	1310	1350	1340	1310	1320	1330	1310	1240	1140	1070	1250
SOUTH	Global	1220	1060	830	530	470	470	470	480	630	880	1120	1220	780
	Diffuse	600	590	560	490	470	470	470	470	510	570	600	600	530
Clear Day	Global	1870	1570	1040	460	370	370	370	370	780	1390	1790	1930	1020
WEST	Global	780	840	940	990	960	910	830	800	800	790	780	750	850
	Diffuse	490	530	580	610	600	590	590	580	570	540	500	470	550
Clear Day	Global	1100	1210	1310	1350	1340	1310	1320	1330	1310	1240	1140	1070	1250

Average Annual Solar Heat and Illumination – Nearest Available Site

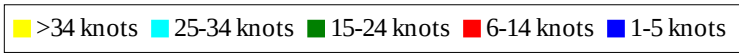
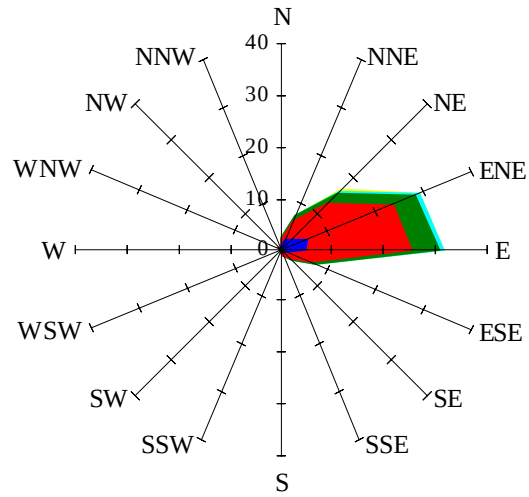
(Source: National Renewable Energy Laboratory, Golden CO, 1995)

AVERAGE TRANSMITTED SOLAR RADIATION (Btu/sq.ft./day) FOR DOUBLE GLAZING, Percentage Uncertainty = 9		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ	Unshaded	1000	1100	1250	1330	1320	1260	1160	1110	1110	1050	990	950	1130
NORTH	Unshaded	270	290	320	340	440	510	460	360	320	300	280	260	350
	Shaded	210	230	250	270	300	320	300	260	240	220	210	200	250
EAST	Unshaded	560	610	680	710	700	660	630	610	610	580	570	540	620
	Shaded	370	400	440	470	450	430	410	390	400	380	380	360	410
SOUTH	Unshaded	850	690	490	350	320	320	330	330	390	560	760	860	520
	Shaded	340	300	290	270	260	250	250	240	260	280	320	360	280
WEST	Unshaded	550	600	670	700	680	640	580	560	570	560	550	520	600
	Shaded	360	390	440	460	440	420	380	360	370	360	360	340	390

AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9		March					June				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	45	87	105	90	44	52	91	104	86	46
	M.Cloudy	35	71	82	71	34	42	71	79	68	35
NORTH	M.Clear	12	17	17	17	12	33	36	35	36	33
	M.Cloudy	12	19	20	20	12	26	32	31	32	24
EAST	M.Clear	76	66	17	17	12	72	60	17	17	13
	M.Cloudy	49	53	20	20	12	50	47	19	19	13
SOUTH	M.Clear	23	40	45	41	23	13	17	17	17	13
	M.Cloudy	19	35	40	36	18	14	19	19	19	13
WEST	M.Clear	12	17	18	69	76	13	17	21	65	71
	M.Cloudy	12	19	20	53	47	14	19	21	50	44
M.Clear	(% hrs)	15	10	11	10	15	9	6	5	5	9
		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	51	92	102	85	38	36	74	87	68	26
	M.Cloudy	38	68	73	60	27	29	58	66	53	19
NORTH	M.Clear	14	17	17	17	11	11	16	17	16	9
	M.Cloudy	14	20	19	19	11	11	18	19	17	8
EAST	M.Clear	76	62	17	17	11	62	55	17	16	9
	M.Cloudy	45	45	19	19	11	39	42	19	17	8
SOUTH	M.Clear	20	33	38	34	16	44	70	78	66	36
	M.Cloudy	17	29	31	26	12	29	51	56	47	20
WEST	M.Clear	14	17	24	71	72	11	16	23	61	55
	M.Cloudy	14	20	23	46	35	11	18	23	44	29
M.Clear	(% hrs)	7	2	3	4	4	19	12	10	10	16

Wind Summary - December, January, and February

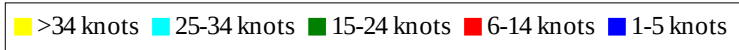
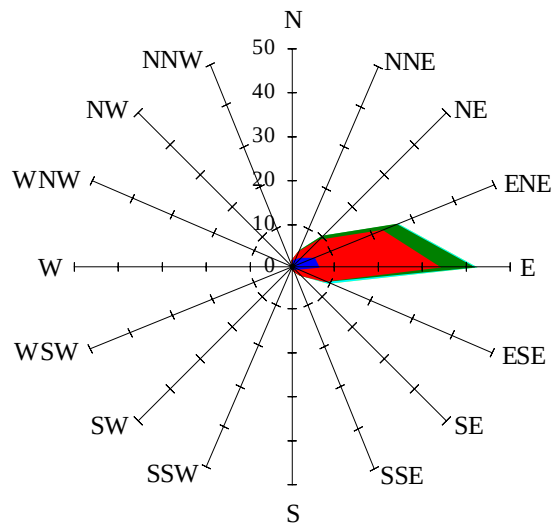
Labels of Percent Frequency on North Axis



Percent Calm = 1.27

Wind Summary - March, April, and May

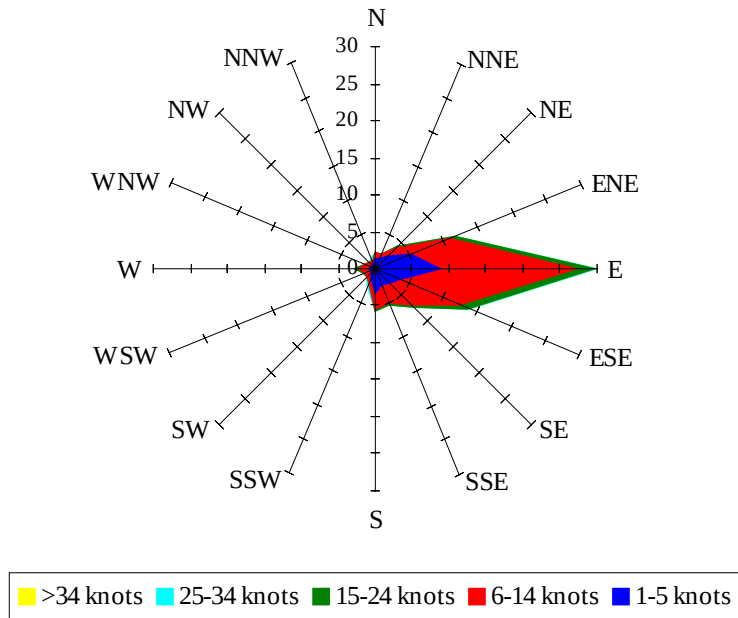
Labels of Percent Frequency on North Axis



Percent Calm = 1.45

Wind Summary - June, July, and August

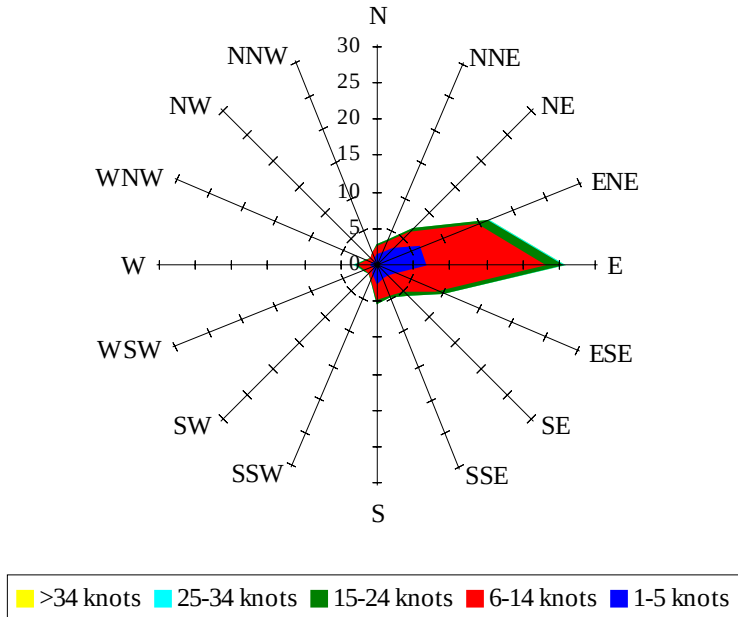
Labels of Percent Frequency on North Axis



Percent Calm = 6.36

Wind Summary - September, October, and November

Labels of Percent Frequency on North Axis



Percent Calm = 6.16